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ABSTRACT

This speech discusses the evaluation and selection of competitive products for schools, and recommends that user specifications be written to include user requirements. The author maintains that product evaluation would be easier if specifications writers would use more performance tests to interpret the user requirements and anticipated environmental forces. (JF)

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HOW TO EVALUATE COMPETITIVE PRODUCTS

CEFP 47th ANNUAL CONVENTION, OKLAHOMA CITY

TUESDAY A. M. GROUP SESSION #5

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FRED WEHLE, JR. - E. F. HAUSERMAN CO.

Gentlemen, if King Solomon had repeatedly had to make decisions, like choosing which of those two women was really the mother of the contested baby, he'd know how a facilities planner or his architect must feel. You must choose wisely between products superficially similar, but with vast differences in future performance for teachers and their students, for the community. This is the sort of looking-into-the-future decision which would challenge Solomon, or even a Delphic Oracle. Yet with great frequency you are doing this, usually with discrimination, and as much care as the importance of the decision will allow. But these decisions are getting tougher all the time. Buildings are becoming more complex, and the components becoming larger, as industrialization and systems building are becoming more widespread. Now we, a couple of sales manager types are supposed to give you some ideas to help you evaluate. At most we can suggest a slightly different approach or give you an idea you can use. I hope so. This subject, "How to Evaluate Competitive Products," is one you'd think any salesman would love to talk about. You'd think he'd yearn to seat himself for a while in the customer's seat and make wise decisions about this or that major purchase for schools.

In spite of occasional carping about haphazard brand decisions, we salesmen in the school market are pretty well impressed with what a good job you actually are doing. For you face a difficult problem in keeping up with rapid change in both of the two fields you bring together; the fields of

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education and construction. Most of us feel you face several very difficult challenges: first, that of staying current with the rapidly changing needs of the teaching professions, is very difficult, with new methods, media and programs. Also keeping current with new products and systems in the construction industry is very hard indeed, so many changes, whole new families of products, new construction methods, and such shifts in costs, always upward, but at rates varying from product to product and trade to trade.

Also, you are fettered by the buying practices in the construction industry, which are very archaic, structured and oriented not to a value analysis, but instead to equating several different items which are assumed to be equal and then letting the low general contractor buy from the sub contract bidder he can chisel or browbeat the most to get a lower price. As if this lack of control weren't enough to try the patience of a saint, you've got some weird legal shackles, too. The Federal Government, some state and even local governments have passed some very restrictive laws, originally to protect the taxpayer from the avarice of venal public servants. But now, responsible professionals are hampered by these same laws.

The rules seem to have been set up so that the final brand decision is not really a decision at all, but is arranged by fate, "impartially." There is seldom a choice between the final three contenders based on evaluation of their merits or their probable relative performance for the use intended. Brand "A", "B", and "C" are somehow equated, and the contract awarded to the lowest bidder.

I recently polled some of our salesmen as to how products are typically evaluated for school buildings. The consensus was that architects usually do the evaluating, and that because of the press of other matters, and the necessity to conserve time; for most items in a building, this evaluation takes place within the architect's office, based on product literature, details, performance tests, small samples and perhaps some weight on what has already been observed, regarding availability and reliability of installation, the sales, and service organizations backing,the proposed products. On this basis he specifies accepted products by name, or performance requirements.

Sometimes the architect visits the field to compare actual installations in-use. Usually he is accompanied by the facilities planner. The visit is often promoted by some professional salesman, whom they both trust. But because of the realities of time, geography and slim architectural fees, these visits are usually limited to evaluating significant items in the school only, perhaps heating, ventilating and air conditioning, lab equipment, lighting, demountable or operable walls and some others.

The evaluation and selection of products seems usually to be a three or four step elimination process. The first step is usually during the design development stage when the architect, his designer or perhaps a facilities planner, makes a decision to use a certain generic family or competing products to fulfill certain user requirements, selecting some types, eliminating other types.

The second evaluation may take place during the working drawing stage, when a narrower spectrum of the type product selected, is drawn-in, as elevations, sections and details, more precisely delineating what is wanted.

The third step is a further refinement. The specifications, further narrow down the field to a relatively few qualified bidders, whose products will meet the final criteria.

Sometimes there is a fourth step, also where instead of seeking the lowest priced product to meet minimum performance, the school district seeks the best product it can get, under a certain maximum price. Or they seek the optimum value for their money, within a maximum amount.

This requires a value analysis of the products and their expected performance, for the use intended. This is a more sophisticated purchase requiring the exercise of judgment in quantifying the value,and comparing values with bid prices. A purchase of this type is usually through the process of a bas bid and requested alternates, shown on the general contractor's bid form,or a purchase directly by the school district. This sub contract may then be assigned to the general contractor.

This subject of evaluation of competitive product should probably be limited to the last two evaluations only, as the first two more closely involve evaluation of generic types.

In making selections for a school, there are just too many items required to allow much time for visits outside, and on-site evaluation. Increasingly architects are relying on performance tests to simulate in-use conditions to be anticipated, to get some sort of quantitative evaluation of competing products. The test results are submitted and become an important part of the evaluation. Partly because of this, the specifications are becoming increasingly sophisticated statements of what minimum standards of per-

formance are expected, rather than a description of some preconceived idea of how the product should be designed, engineered and manufactured. Thus the proprietary brand specification with the all inclusive "or equal" clause, is giving away to the scientifically prepared performance specification. Such specifications, once written for a project, go a long way toward making evaluation of products much easier for the architect and the facilities planner. For first, a great deal of very specialized technical analysis of user needs and environmental forces is needed.

Painstaking analysis and experimentation is needed to arrive at performance tests which will simulate and can measure expected in-use product performance. Most school districts can't afford such research costs. But, like the new consumer products which come as "fall-out" from the space science program, we are beginning to have available to us fallout in the form of the results of some pretty expensive research done for systems school building programs like SCSD, SSP and SUCF. This information has great potential value for everyone, to help in product evaluation in types of construction totally unrelated to systems buildings.

Look at the specs on large systems projects! The information I am referring to is an array of performance tests, which quantitatively measure the anticipated performance of building components, subjected to accelerated laboratory simulations of the user requirements and the environmental forces at work in a school. The Detroit Public Schools Construction Systems (CSP) Program, for instance, has a very scholarly, technical specification for Interior Space Division, Sub System #4. There are 16

different performance tests specified; for finish; relocatability, fire resistance, impact, sound attenuation, etc. There are also numerous and important functional requirements, which are measurable only on a "Yes it does it" or "No it doesn't do it" basis, but which are equally important.

The performance tests submitted by various competitors in response to all these paragraphs of the specifications will provide Detroit with the basis for an accurate evaluation of the proposed wall systems.

To Detroit facilities planners and their architects, these ASTM Tests, Federal Spec Numbers, etc. mean a very specific level of performance to meet criteria, to meet a very specific environmental forces in the new buildings. For instance, there's an impact test where a 60 pound sandbag is dropped three feet onto a 10 foot panel supported at the four corners, to measure deflection and set. Why? Well, you can't really tell from the specs. This test is probably designated to reproduce the human environmental forces present in a busy high school corridor, when a 200 pound tackle pushes the full back playfully but hard against the corridor wall. Naturally you'd measure the effect of a think like this with an ASTM Test; (E72-61) and you'd limit the permanent set resulting from this to $\frac{1}{1}$". That is, you would if you knew for sure why they have that test in the specs, and what it is designed to simulate, what sort of abuse it measures.

What I'm saying is, that these specs are great for the people who wrote them, but they don't do much for the rest of us when it comes to using this knowledge on another project, because we don't really know just what they are trying to achieve or to simulate with the test. They know though, because Detroit did plenty of research on the SCSD buildings and performance specs before they wrote theirs. Some of us might think this approach too

empirical, because we don't know how they arrived at it, or what the test really proves.

However, at slight extra trouble and expense, the scientific experts who, after much research arrived at the test and criteria for acceptance, could humanize it and reproduce for the profession and for posterity the problem they were solving, as well as their test or solution. Then any architect or facilities planner might with impunity use the performance information in his own specs, if the problem is similar, and he's satisfied with the logic of it. The originator would be sharing knowledge, like a doctor who comes up with a new diagnostic breakthrough which he writes about. Sharing with others in his profession. All the needed facts are available somewhere, because these facts were the original human user requirements which were analyzed to arrive at the tests, measurement and criteria. All we need is to preserve the English language statement of what was intended, preferably in the specs themselves.

A simple example of this user requirement, test and criteria process, is the original criteria for operable wall, which we at Hauserman got from Educational Facilities Laboratories (EFL) back in 1961. Each requirement was humanized, stated in English prose, relative to school and kids. Then it was quantified by a test simulating the requirement and stating a minimum acceptable performance!

For instance, they wanted the wall to provide sound privacy so that a class taking a test on one side would not be disturbed by a class reciting on the other side. They specified a test, ASTM 119-61 and a sound transmission class of 40.

They wanted a wall which could be easily operated by any teacher between class periods, manually, no electric motors. As the minimum available operating force, they selected the equivalent of a small 95 pound female school teacher. This force to operate the wall, they then set as 25 pounds (after some very human experiments with pretty little 95 pound teachers.)

They also specified that the panel surfaces be rigid and flat for accepting chalk or tackboards, and that it be simple and maintenance free, etc.

If the SCSD and Detroit CSP specs had included the user requirements which they are testing for, or if they provided some ancilary literature for the profession; we could all share in the benefits of this basic research. But for us to use it, we must know what they are striving to achieve.

The University of New York has done precisely this with their interim report, "Interior Finishes Performance Criteria" put out by the State University Construction Fund (fondly called SUCF by its friends) This 1968 publication gives an array of user requirements for each function referred to, and shows use areas to which each level would be appropriate. Then it gives test and criteria for each level of requirement. It is however limited to interior finishes. It is to have computerized data storage on criteria and materials.

The Toronto SEF Program (Study of Educational Facilities) is probably the most exhaustive and extensive study to date. It involves all of the related social and technical factors bearing on educational facilities and how they can be built more effectively. They published a five volume account of the project which does include two on user requirements and others on the performance specifications which they developed. They worked closely with the Canadian Standards Association in selecting appropriate tests and developed new standard tests when no suitable tests yet existed. CSA

people then checked out these performance tests themselves on the SEF Projects' building mock up.

This research material, the results of millions of dollars and five years research in five volumes is available to anyone wishing to purchase it from the City of Toronto. Just write to_____

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The cost is$_____U. S.

If the other agencies managing the systems programs and writing performance specs, would also provide human user requirements in English prose to explain their specs, we'd all be the wiser, and we also could use their test information to specify performance, when applicable. As it is, I think some current specs are still based on California's SCSD specs where the San Andreas Fault and seismic codes were an important consideration. (How much are we paying for unintended earthquake protection in some subsequent school projects in the East?)

As more school environmental forces and user needs are simulated by performance tests; let's share! And let's humanize specs!

If we can get these valid measures, we can better evaluate competing products. Then let's use more performance test paragraphs in specs, for evaluation purposes. Even where products are called for by brand name.

But evaluation by physical tests usually doesn't give the whole story, and won't work well for some products. Here simulation or models may help. Mock-ups for testing of function and seeing the appearance, are still used for large building projects.

When practical, significant brand decisions are being made by facilities planners and their architects after visits to see the competing products in service in existing schools. To be more objective they usually have with them a prepared series of questions to be answered by observation, and questioning of teachers and principals. It takes judgment to objectively evaluate the level of performance of each competing product in several categories. Sometimes these categories are weighted in importance and sometimes numerical values are assigned to various levels of performance to arrive at an overall picture of relative worth. It helps to organize this on a grid.

As a sales manager, I can tell you that you can get some free help in making these evaluations, the competing salesmen who represent the manufacturers are experts in product differentiation, but a very biased source of information. How can you use their knowledge yet not accept their bias? Though many brands superficially are as like as two peas in a pod, they may perform quite differently. The salesmen, if asked, can provide a check list for comparing the competing products. Get from each salesman a check list well before you are to go. Naturally each check list will stress the importance to you of the product characteristics wherein the writer's product is strongest. Since you are getting two or more competing check lists as a basis, you can come up with your own , list which weighs the various factors more equitably, for your own needs, utilizes the salesmens ability to differentiate. If you and your architect go to visit schools with various competing salesmen, this composit predone check can help you to remember what you observed and make sure you ask the right questions. Try to make competing product visits as close together as possible in time, so grading will be more consistent. Then enter the facts on a prepared

grid to organize your observations and let you assign value points for a summary of strong points and weaknesses for a comparative analysis.

In some states educators are making some post bid brand decisions after a value analysis and are opting for the best value rather than just the lowest price. Often the lowest bid is not really the best buy, as the GSA recognizes with its "Life Cycle Cost" evaluation system. With prices spiralling upward, there may be some advantage to doing this, to give some flexibility to buying after bids are in.

In summary - Three main points I made were:

1. Evaluation would be easier, if your spec writer would use more performance tests to interpret the user requirements and the anticipated environmental forces. This would help you evaluate both at the spec writing stage to help limit bidding to qualified products only, and after bidding to analyze value for the best buy among the brands bid.

2. The spec writer has reference to specs from big systems jobs but needs a Rosetta Stone to decipher them, so let's share, and include user needs in the specs, in prose.

3. Get help free from competing salesmen. Combine their comparison check lists to make a value grid with assigned point values for performance test results, field observations and reliability. Then compare and evaluate brands, perhaps with bid $ amounts shown on the grid also.

Gentlemen, it was a great pleasure to have this opportunity to talk to you. I hope I have been able to offer you something you can use to help you when you are again faced with "King Solomon's Choice."